

MEPNN Supplier Scouting Opportunity Synopsis

Section 1: General Information

Scouting Number	2024-307
Item to be Scouted	Particulate Monitor
Days to be scouted	30
Response Due By	11/08/2024
Description	<p>seeking Diameter Resolved and Time Resolved (>1 Hz) Particulate Monitor with size resolved filter collection</p> <p>At the U.S. EPA's National Vehicle and Fuel Emissions Laboratory (NVFEL), an initiative has been started to understand PM emissions from tire and brake wear and the potential impacts of these emissions on air quality and human health. With the electrification of the U.S. motor vehicle fleet, PM emissions from tire and brake wear will become increasingly important. An important diagnostic instrument will be an analyzer that incorporates measurement of PM mass and number concentrations across a wide range of particle sizes at near real-time resolution together with size resolved particle deposition onto filters to understand the complexities of emissions and impacts. This is a procurement to acquire a high time resolution, near 10 Hz, wide particle size distribution analyzer that incorporates a particle size resolved multi-filter collection capability for use at the EPA's NVFEL.</p>
Notify Requester Immediately	
State item to be used in	Michigan

Section 2: Technical Information

Type of supplier being sought	Distributor
Reason	BABA
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Electronic Assembly

Provide dimensions / size / tolerances / performance specifications for the item	<p>The analyzer must meet the following specifications for each of the items (1 – 4) listed below.</p> <p>1) Ability to simultaneously measure PM size concentrations and collect PM on filters over a wide particle size range 0.006 - 10 μm</p> <p>a. Ability to collect aerodynamic diameter size differentiated aerosols on filters for up to 14 sintered collection plates with impactor 50% cutpoints whose aerodynamic diameter bins are on the order of 5 per decade $[\log(d_i) - \log(d_{i-1})] \sim 0.15$ to 0.3 where d_i and d_{i-1} are the 50% cutpoint aerodynamic diameters for two adjacent impactors]</p> <p>b. Report time resolved (10 Hz) aerodynamic size distributions with diameter bins on the order of 30 to 150 per decade</p> <p>c. With a sensitivity of:</p> <p>i. 250 particles/cm³ for 10 nm particles</p> <p>ii. 20 particles /cm³ for 100 nm particles</p> <p>iii. 1.0 particles /cm³ for 1 μm particles</p> <p>iv. 0.1 particles /cm³ for 5 μm particles</p> <p>d. Dry scroll pump capable of 20 m³/h @ 40 mbars</p> <p>e. Ability to sample at temperatures from 10-180 °C</p> <p>f. Ability to sample at 0-90 % RH</p> <p>g. Power capabilities at 100-250 V, 50-60 Hz, 200 W</p> <p>2) User interface/data control and acquisition software and hardware:</p> <p>a. Hardware</p> <p>i. Ethernet communication port for instrument control, data transfer and compatibility with NVFEL engine and vehicle dynamometer test cell communication protocols</p> <p>ii. Front panel user display with appropriately labeled control knobs, buttons, and/or switches</p> <p>iii. Panels with appropriately labeled input gas and sample connectors</p> <p>b. Software</p> <p>i. Able to monitor and log multiple instrument operation parameters, but not limited to, raw sample and dilution gas flows, mass concentration, sample gas temperatures and pressures</p> <p>ii. Compatible with Microsoft Windows 10</p> <p>iii. Data output to standardized, non-proprietary file format nonspecific to a particular software application (e.g., ASCII or text file format with standard delimiters that do not contain specialized formatting characters)</p> <p>3) Dual power (500 watts maximum):</p> <p>a. 120 volt AC, 60Hz, 2 amp</p> <p>b. 24 volt DC, 20 amp</p> <p>4) Minimal impact on facility resources in terms of safety considerations (electrical connections insulated and covered, safety switches, guards for rotating parts, ...). All safety considerations and mitigation will be explained in writing in the proposal.</p>
List required materials needed to make the product, including materials of product components	Various, dependent on implementation
Are there applicable certification requirements?	No
Are there applicable regulations?	No
Are there any other standards, requirements, etc.?	No
NAICS 1	334516 Analytical laboratory instrument manufacturing
NAICS 2	

Additional Technical Comments	<p>Additional information.</p> <p>Do you have a diagram, image, and/or illustration of the item? o Please see the following link (https://dekati.com/products/high-resolution-elpi/)</p> <p>Please see the links below for examples of brake and tire wear emissions measurements and facilities o https://www.sciencedirect.com/science/article/pii/S004896972306391X (Direct measurement of brake and tire wear particles based on real-world driving conditions) o https://www.linkeng.com/aerospace-testing-solutions/ o https://www.sciencedirect.com/science/article/pii/S004896972306391X (Direct measurement of brake and tire wear particles based on real-world driving conditions) o On-Road Vehicle Measurement of Tire Wear Particle Emissions and Approach for Emission Prediction Tire Science and Technology (allenpress.com) o Model 3900 NVH Brake Dynamometer Link Engineering Equipment - Testing - Support o Tires and Wheels Testing Test Equipment & Engineering Support (linkeng.com)</p>
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Section 4: Business Information

Estimated potential business volume	One-time purchase
Estimated target price / unit cost information (if unavailable explain)	\$110,000
When is it needed by?	2 months
Describe packaging requirements	individually packaged
Where will this item be shipped?	Ann Arbor, MI

Additional Comments

Is there other information you would like to include?	
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Performance Work Statement

High time resolution and wide particle size distribution analyzer with size resolved multi-filter collection capability

Date of Justification: October 10, 2024

Program Office: U.S. Environmental Protection Agency
NVFEL
Assessment and Standards Division
Data and Testing Center
2565 Plymouth Road
Ann Arbor, MI 48105

Project Officer: Bob Giannelli

Title of Project: High time resolution and wide particle size
distribution analyzer

PURPOSE

The purpose of this contract is to procure a high time resolution and wide particle size distribution analyzer, either in standalone or combined packaging, for measuring near real-time concentrations of particulate matter (PM) emitted from tire and brake wear on motor vehicles. The analyzer must be able to measure PM concentrations at size distributions ranging from 0.006 - 10 μm at temporal resolution at or higher than 10 Hz which includes a size resolved multi-filter collection capability. This instrument will supplement existing aerosol mass, size, and number instruments being used to evaluate PM emissions from vehicle tire and brake wear.

BACKGROUND

At the U.S. EPA's National Vehicle and Fuel Emissions Laboratory (NVFEL), an initiative has been started to understand PM emissions from tire and brake wear and the potential impacts of these emissions on air quality and human health. With the electrification of the U.S. motor vehicle fleet, PM emissions from tire and brake wear will become increasingly important. An important diagnostic instrument will be an analyzer that incorporates measurement of PM mass and number concentrations across a wide range of particle sizes at near real-time resolution together with size resolved particle deposition onto filters to understand the complexities of emissions and impacts.

This is a procurement to acquire a high time resolution, near 10 Hz, wide particle size distribution analyzer that incorporates a particle size resolved multi-filter collection capability for use at the EPA's NVFEL.

SCOPE STATEMENT

The contractor shall provide all instrument hardware and software. The analyzer must meet the following specifications for each of the items (1 – 4) listed below. There will be no exception to these specifications.

- 1) Ability to simultaneously measure PM size concentrations and collect PM on filters over a wide particle size range 0.006 - 10 μm
 - a. Ability to collect aerodynamic diameter size differentiated aerosols on filters for up to 14 sintered collection plates with impactor 50% cutpoints whose aerodynamic diameter bins are on the order of 5 per decade [$\log(d_i) - \log(d_{i-1}) \approx 0.15$ to 0.3 where d_i and d_{i-1} are the 50% cutpoint aerodynamic diameters for two adjacent impactors]
 - b. Report time resolved (10 Hz) aerodynamic size distributions with diameter bins on the order of 30 to 150 per decade
 - c. With a sensitivity of:
 - i. 250 particles/ cm^3 for 10 nm particles
 - ii. 20 particles / cm^3 for 100 nm particles
 - iii. 1.0 particles / cm^3 for 1 μm particles
 - iv. 0.1 particles / cm^3 for 5 μm particles
 - d. Dry scroll pump capable of 20 m^3/h @ 40 mbars
 - e. Ability to sample at temperatures from 10-180 $^{\circ}\text{C}$
 - f. Ability to sample at 0-90 % RH
 - g. Power capabilities at 100-250 V, 50-60 Hz, 200 W
- 2) User interface/data control and acquisition software and hardware:
 - a. Hardware
 - i. Ethernet communication port for instrument control, data transfer and compatibility with U.S. EPA National Vehicle Fuel and Emissions Laboratory engine and vehicle dynamometer test cell communication protocols
 - ii. Front panel user display with appropriately labeled control knobs, buttons, and/or switches
 - iii. Panels with appropriately labeled input gas and sample connectors
 - b. Software
 - i. Able to monitor and log multiple instrument operation parameters, but not limited to, raw sample and dilution gas flows, mass concentration, sample gas temperatures and pressures
 - ii. Compatible with Microsoft Windows 10
 - iii. Data output to standardized, non-proprietary file format nonspecific to a particular software application (e.g., ASCII or text

file format with standard delimiters that do not contain specialized formatting characters)

- 3) Dual power (500 watts maximum):
 - a. 120 volt AC, 60Hz, 2 amp
 - b. 24 volt DC, 20 amp
- 4) Minimal impact on facility resources in terms of safety considerations (electrical connections insulated and covered, safety switches, guards for rotating parts, ...). All safety considerations and mitigation will be explained in writing in the proposal.

TASK(S) DESCRIPTION

The contractor must provide one High time resolution and wide particle size distribution analyzer per product specification under Scope and Objective Statement section above. The analyzer must be installed and configured according to the manufacturer's recommended installation and configuration guidelines.

The delivered analyzer and auxiliary components must be new and must meet each of the items specified in the Scope Statement. The manufacturer's warranty and the warranty period of at least 1 year must be specified in the proposal.

DELIVERABLES

- 1) One High time resolution and wide particle size distribution analyzer
- 2) Additional items as described in items 1-4 in Scope Statement
- 3) Instrument user manuals
- 4) All instruments and documentation shall be delivered within 60 days following the date the contract has been awarded.

ACCEPTANCE CRITERIA

The following requirements will be evaluated on a Lowest Price and Technically Acceptable basis. Offerors shall provide information to demonstrate that the proposal meets the minimum requirements. Offeror shall demonstrate in its proposal that

- 1) the analyzer meets the specifications listed in the Scope Statement above, i.e., meets all the specifications listed in items 1 through 4, and will meet all the deliverables and schedules listed in the Deliverables section.
- 2) Deliverable items 1, 2, and 3 within one month of delivery at the EPA NVFEL shall be demonstrated by manufacturer to EPA to perform as specified in the Scope Statement

NON-DISCLOSURE AGREEMENT

All documentation acquired and/or provided by EPA or generated as a result of this project shall be under the control of the U.S. EPA Assistant Administrator for Air and Radiation, or his or her designated representative, and shall not be released by the Contractor to any other source without specific approval by U.S. EPA.